

ART 34 AMEND

- 22 -

WE CLAIM:

1. A composition comprising  $\beta$  human chorionic gonadotropin protein ( $\beta$ hCG) and/or fusions, fragments or analogs thereof, and a chitosan-based adjuvant, wherein the amount of  $\beta$ hCG ranges from about 10  $\mu$ g to about 500  $\mu$ g.
2. The composition of claim 1 wherein the amount of  $\beta$ hCG is about 25  $\mu$ g.
3. The composition of claim 2 wherein the amount of  $\beta$ hCG is about 250  $\mu$ g.
4. The composition of claim 1-3 wherein the  $\beta$  human chorionic gonadotropin protein comprises a recombinant polypeptide.
5. The composition of claim 4 wherein the recombinant polypeptide further comprises the amino acid sequence of SEQ ID NO: 2 or 4.
6. The composition of claim 1 wherein the chitosan-based adjuvant comprises an emulsion of chitosan, sodium hydroxide, a biodegradable oil, a surfactant, and an aqueous buffer.
7. The composition of claim 6 wherein the biodegradable oil is squalene.
8. The composition of claim 6 wherein the ratio of  $\beta$ hCG protein and/or fusions, fragments or analogs thereof to adjuvant is in the range of about 1:20 (w/w) to about 1:1500 (w/w).

APT 34 AMPT

- 23 -

9. The composition of claim 1 wherein the adjuvant comprises chitosan, a metal salt, and an aqueous buffer.

10. The composition of claim 9 wherein the metal salt is selected from the group consisting of zinc acetate, nickel sulfate, and copper sulfate.

11. The composition of claim 9 wherein the ratio of  $\beta$ hCG, fragments or analogs thereof to adjuvant is in the range of about 1:20 (w/w) to about 1:1500 (w/w).

12. The composition of claim 4 wherein the recombinant  $\beta$ hCG comprises a fusion protein consisting essentially of a  $\beta$ hCG protein or fragment or analog thereof joined to a  $\beta$ -galactosidase protein or fragment thereof.

13. A method of inducing infertility in a female mammal comprising administering at least one dose of a vaccine containing a  $\beta$ hCG proteins and/or fusions, fragments or analogs thereof in combination with a chitosan-based adjuvant in an amount effective to stimulate production of antibodies which recognize native circulating hCG proteins.

14. The method of claim 13 wherein the amount of  $\beta$ hCG ranges from about 10  $\mu$ g to about 500  $\mu$ g

15. The method of claim 14 wherein the amount of  $\beta$ hCG is about 250  $\mu$ g.

16. The method of claim 13-15 wherein the  $\beta$  human chorionic gonadotropin protein comprises a recombinant polypeptide.

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ART 34 AMEND

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- 24 -

17. The method of claim 16 wherein the recombinant polypeptide further comprises the amino acid sequence of SEQ ID NO: 2 or 4.

18. The method of claim 13 wherein the chitosan-based adjuvant comprises an emulsion of chitosan, sodium hydroxide, a biodegradable oil, a surfactant, and an aqueous buffer.

19. The method of claim 18 wherein the biodegradable oil is squalene.

20. The method of claim 18 wherein the ratio of  $\beta$ hCG protein and/or fusions, fragments or analogs thereof to adjuvant is in the range of about 1:20 (w/w) to about 1:1500 (w/w).

21. The method of claim 13 wherein the adjuvant comprises chitosan, a metal salt, and an aqueous buffer.

22. The method of claim 21 wherein the metal salt is selected from the group consisting of zinc acetate, nickel sulfate, and copper sulfate.

23. The method of claim 21 wherein the ratio of  $\beta$ hCG protein and/or fusions, fragments or analogs thereof to adjuvant is in the range of about 1:20 (w/w) to about 1:1500 (w/w).

24. The method of claim 16 wherein the recombinant  $\beta$ hCG comprises a fusion protein consisting essentially of a  $\beta$ hCG protein or fragment or analog thereof joined to a  $\beta$ -galactosidase protein or fragment thereof.

SUBSTITUTE SHEET

AMENDED SHEET

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- 25 -

25. A method for inducing transient infertility in a mammal comprising:

a) administering a recombinant  $\beta$ hCG protein and/or fusion, fragment or analog thereof expressed by a species of host cell in combination with a chitosan-based adjuvant; and

b) administering a recombinant  $\beta$ hCG protein, fragment or analog thereof, expressed by a different species of host cell than said recombinant  $\beta$ hCG administered in step a) in combination with a chitosan-based adjuvant; and

wherein the amount of  $\beta$ hCG administered in step b) is effective to stimulate production of antibodies which recognize native circulating hCG proteins.

26. The method of claim 25 wherein the amount of  $\beta$ hCG ranges from about 10  $\mu$ g to about 500  $\mu$ g.

27. The method of claim 26 wherein the amount of  $\beta$ hCG is about 250  $\mu$ g.

28. The method of claim 25 wherein the recombinant polypeptide further comprises the amino acid sequence of SEQ ID NO: 2 or 4.

29. The method of claim 25 wherein the chitosan-based adjuvant comprises an emulsion of chitosan, sodium hydroxide, a biodegradable oil, a surfactant, and an aqueous buffer.

30. The method of claim 29 wherein the biodegradable oil is squalene.

SUBSTITUTE SHEET

AMENDED SHEET

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31. The method of claim 29 wherein the ratio of  $\beta$ hCG protein and/or fusions, fragments or analogs thereof to adjuvant is in the range of about 1:20 (w/w) to about 1:1500 (w/w).

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32. The method of claim 25 wherein the adjuvant comprises chitosan, a metal salt, and an aqueous buffer.

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33. The method of claim 32 wherein the metal salt is selected from the group consisting of zinc acetate, nickel sulfate, and copper sulfate.

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34. The method of claim 32 wherein the ratio of  $\beta$ hCG proteins and/or fusions, fragments or analogs thereof to adjuvant is in the range of about 1:20 (w/w) to about 1:1500 (w/w).

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35. The method of claim 25 wherein the recombinant  $\beta$ hCG comprises a fusion protein consisting essentially of a  $\beta$ hCG protein or fragment or analog thereof joined to a  $\beta$ -galactosidase protein or fragment thereof.

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36. A method of inducing antibody formation in a mammal comprising:

- a) administering a recombinant  $\beta$ hCG protein and/or fusion, fragment or analog thereof expressed by a species of host cell in combination with a chitosan-based adjuvant; and
- b) administering a recombinant  $\beta$ hCG protein and/or fusion, fragment or analog thereof, expressed by a different species of host cell than said recombinant  $\beta$ hCG administered in step a) in combination with a chitosan-based adjuvant; and

wherein the amount of  $\beta$ hCG administered in step b) is effective to stimulate production of antibodies which recognize native circulating hCG proteins.

5 37. The method of claim 36 wherein the amount of  $\beta$ hCG ranges from about 10  $\mu$ g to about 500  $\mu$ g.

38. The method of claim 37 wherein the amount of  $\beta$ hCG is about 250  $\mu$ g.

10 39. The method of claim 37 wherein the recombinant polypeptide further comprises the amino acid sequence of SEQ ID NO: 2 or 4.

15 40. The method of claim 36 wherein the chitosan-based adjuvant comprises an emulsion of chitosan, sodium hydroxide, a biodegradable oil, a surfactant, and an aqueous buffer.

20 41. The method of claim 40 wherein the biodegradable oil is squalene.

42. The method of claim 40 wherein the ratio of  $\beta$ hCG proteins and/or fusions, fragments or analogs thereof to adjuvant is in the range of about 1:20 (w/w) to about 1:1500 (w/w).

25 43. The method of claim 36 wherein the adjuvant comprises chitosan, a metal salt, and an aqueous buffer.

30 44. The method of claim 43 wherein the metal salt is selected from the group consisting of zinc acetate, nickel sulfate, and copper sulfate.

- 28 -

ART 34 AMDT

45. The method of claim 43 wherein the ratio of  $\beta$ hCG proteins and/or fusions, fragments or analogs thereof to adjuvant is in the range of about 1:20 (w/w) to about 1:1500 (w/w).

46. The method of claim 36 wherein the recombinant  $\beta$ hCG comprises a fusion protein consisting essentially of a  $\beta$ hCG protein or fragment or analog thereof joined to a  $\beta$ -galactosidase protein or fragment thereof.

47. The use of  $\beta$ hCG for the manufacture of a medicament for inducing transient infertility in a mammal wherein the medicament comprises an injectable formulation containing  $\beta$  human chorionic gonadotropin proteins and/or fusions, fragments or analogs thereof, in combination with a chitosan-based adjuvant in an amount effective to stimulate production of antibodies which recognize native circulating hCG proteins.

48. The use of claim 47 wherein the amount of  $\beta$ hCG ranges from about 10  $\mu$ g to about 500  $\mu$ g.

49. The use of claim 48 wherein the amount of  $\beta$ hCG is about 250  $\mu$ g.

50. The use of claim 47 wherein the  $\beta$  human chorionic gonadotropin protein comprises a recombinant polypeptide.

51. The use of claim 50 wherein the recombinant polypeptide further comprises the amino acid sequence of SEQ ID NO: 2 or 4.

SUBSTITUTE SHEET

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APT 24 AMT

- 29 -

52. The use of claim 47 wherein the chitosan-based adjuvant comprises an emulsion of chitosan, sodium hydroxide, a biodegradable oil, a surfactant, and an aqueous buffer.

5 53. The use of claim 52 wherein the biodegradable oil is squalene.

10 54. The use of claim 52 wherein the ratio of  $\beta$ hCG protein, fragments or analogs thereof to adjuvant is in the range of about 1:20 (w/w) to about 1:1500 (w/w).

15 55. The use of claim 47 wherein the adjuvant comprises chitosan, a metal salt, and an aqueous buffer.

20 56. The use of claim 55 wherein the metal salt is selected from the group consisting of zinc acetate, nickel sulfate, and copper sulfate.

25 57. The use of claim 55 wherein the ratio of  $\beta$ hCG proteins and/or fusions, fragments or analogs thereof to adjuvant is in the range of about 1:20 (w/w) to about 1:1500 (w/w).

58. The use of claim 50 wherein the recombinant  $\beta$ hCG comprises a fusion protein consisting essentially of a  $\beta$ hCG protein or fragment or analog thereof joined to a  $\beta$ -galactosidase protein or fragment thereof.